Maximum power point tracking analysis of a coreless ironless electric generator for renewable energy application

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ABSTRACT
The magnetism attraction between permanent magnets and soft ironcore lamination in a conventional electric ironcore generator is often known as cogging. Cogging requires an additional input power to overcome, hence became one of the power loss sources. With the increasing of power output, the cogging is also proportionally increased. This leads to the increasing of the supplied power of the driver motor to overcome the cog. Therefore, this research is embarked to study fundamentally about the possibility of removing ironcore lamination in an electric generator to see its performance characteristic. In the maximum power point tracking test, the fabricated ironless coreless electricity generator was tested by applying the load on the ironless coreless electricity generator optimization to maximize the power generated, voltage and the current produced by the ironless coreless electricity generator when the rotational speed of the rotor increased throughout the test. The rotational torque and power output are measured, and efficiency is then analyzed. Results indicated that the generator produced RMS voltage of 200VAC at rotational speed of 318 RPM. Torque required to rotate the generator was at 10.8Nm. The generator had working efficiency of 77.73% and the power generated was at 280W.

KEYWORDS:
Laminating; Maximum power point trackers; Electricity generators